

Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

Commissioner of Conservation

AND

State Forester

FOR THE

YEAR ENDING NOVEMBER 30, 1932

DEPARTMENT OF CONSERVATION

[OFFICES: 20 SOMERSET STREET, BOSTON, MASS.]



The Commonwealth of Massachusetts

OUTLINE OF THE

REPORT OF THE DEPARTMENT OF CONSERVATION

The report of the Department of Conservation is divided for convenience and economy into four parts, as follows:—

Part I. The organization and general work of the Department of Conservation.

Part II. The work of the Division of Forestry. (Parts I and II are printed in this pamphlet: Public Document No. 73)

Part III. The work of the division of Fisheries and Game. (Printed separately as Public Document No. 25)

Part IV. The work of the Division of Animal Industry. (Printed separately as Public Document No. 98)

PART I.

ANNUAL REPORT OF THE COMMISSIONER OF CONSERVATION

The annual report of the Department of Conservation is herewith submitted. For details of the work of the Divisions of Forestry, Fisheries and Game and Animal Industry, see special reports, Parts II., III., IV.

On January 20, Governor Ely appointed Daniel F. McGrath, Director of the Division of Parks. An office was secured for this division on the sixth floor of the Metropolitan Building where the Department of Conservation has its offices. An appropriation of \$8,304.84 was made for this division.

I am sorry to say that I cannot report any accomplishment made by the Division of Parks during the year to further the recreational possibilities of state-owned lands.

In March an appropriation for emergency work to be used in employing needy persons who were idle on account of industrial depression was made available. The amount of this appropriation was \$110,000 and with this fund about 1,288 persons were given work. The men were recruited from 128 towns and cities and the work provided was brushing, burning, road-mending, bridge-building and planting on the state forests. Men with families were given preference and so far as possible we worked in conjunction with welfare or unemployment committees. It is gratifying to report that less than 2 per cent of the whole appropriation was expended for supplies and necessary equipment, all the balance being used for labor.

FOREST CONSERVATION

The work of forest conservation carried on by the Forestry Division divides itself into several sub-divisions, naturally. First: nursery work, raising of trees for reforestation, both by the State on all its state owned land, and by individuals through sale by the department office; second: care of the State forests, purchase, development, for investment and for recreation; third: prosecution of fire prevention, by propaganda, and by inspection and by patrol; fourth: suppression of the gypsy moth and the brown-tail moth, in accordance with the law; fifth: extension and general forestry work,— under this head all educational work is done, lectures given, instruction to farmers, and advice to owners of woodland. There has been no new work introduced this year, and from all appropriations made for our work, as large a proportion as possible has been expended for labor. The emergency appropriation for work on State forests was handled without extra service in the office by splendid cooperation and industry.

RECREATIONAL USE OF STATE FORESTS

During the year 1932 we improved the camping places on our State forests. There are now 19 camping grounds on our forests, many supplied with water and all equipped with tables. There are in all 71 tables with benches, 70 fireplaces, and 10 comfort stations or toilets. Nine of these camping grounds are for overnight use and week-end camping, and are among those equipped with fireplaces, tables and comfort stations.

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Over 50,000 people enjoyed these various camping grounds during the season. About 100 tables with benches are in process of being made at the present time, and we expect to construct several more fireplaces, as our present equipment does not suffice for the public demand.

CONSERVATION OF WILD LIFE

Applied science has had an important bearing upon the advance of civilization and it has solved many difficult problems which have beset mankind. The problems in the field of wild life conservation depend very largely upon scientific research and the practical application of the facts obtained.

The more difficult problems of maintaining a wild life supply can not be solved in the legislative halls nor in the court rooms. The remedy does not lie alone in the building of more and larger fish hatcheries and game farms.

The important consideration is a very extensive and detailed study along recognized biological lines concerning the actual welfare of the wild life in its natural habitat.

It is useless to propagate and distribute game birds unless there is some information available as to what becomes of them after they are liberated in the covers. They must be assisted in severe winter weather and protected against the inroads of predators where excessive numbers of those species threaten the existence of a valuable wild life.

The ponds and streams of the State must be biologically surveyed to determine their relative value as fish producing units, as the release of fish in waters where neither breeding nor feeding grounds exist is a useless waste of the expensive output of State fish hatcheries.

The wild life resources of the State must be considered as a crop, whether they are game birds, or song and insectivorous, or non-game birds.

Before the seed is sown the producing capacity of the area must be considered and the crop must be cultivated with as much scientific care as obtains in the field of agriculture.

In the field of marine fisheries the need of scientific research is more necessary, perhaps, than in any other branch of wild life conservation as that resource is being exploited on an extensive commercial basis, and its continued existence depends upon obtaining the best biological information of the resources of the shellfish flats and coastal waters and a judicious application of business principles in the use of the facts obtained.

The terms "hunting" and "fishing" are misleading under present-day conditions as they suggest the unlimited taking of a natural resource, but conservation work of the present day requires that we substitute the rational harvest of a cultivated crop to replace our past practices.

CONSERVATION OF THE HEALTH OF DOMESTIC ANIMALS

The Division of Animal Industry has charge of the control, prevention and suppression of contagious diseases in domestic animals.

Eradication of Bovine Tuberculosis is the most important activity of this Division and has progressed rapidly during the year. At the beginning of the year there were 61 towns in which the area test had been completed, exclusive of Barnstable County which is a Modified Accredited Area. This number has been increased in 1932, by 81 towns, 23 of which were declared Modified Accredited Areas as compared with four of the 61 towns last year. Petitions for the area test and quarantine have been received from 276 cities and towns, which including the 15 towns of Barnstable County, would make 291 of the 355 cities and towns of the Commonwealth. There were 237,718 tuberculin tests applied or 72,085 more tests than the previous year.

The number of positive cases of rabies has decreased this year to 300 from 484 in 1931. During the past two years, partly owing to more stringent quarantine measures, rabies has been steadily decreasing. 4,742 dogs were reported during the year as having bitten persons.

The treatment, applied at request of the owner, for the prevention of hog cholera and control of hemorrhagic septicemia continues to be an important service to the public.

The accreditation of herds as freed from Bang disease is increasing, as there are

at present 12 accredited herds comprising 476 animals, and 27 applications for accreditation on file.

The Brighton Market is the main source of cattle replacements in the eastern part of the State and 10,486 cattle were received and dispersed from this Market. The number of cattle outside of the Brighton Market shipped into this Commonwealth has increased this year about $33\frac{1}{2}$ per cent.

STANDISH MONUMENT RESERVATION

The season of 1932 showed an appreciable falling off in visitors to the tower on Captain's Hill. The official record of visitors to the tower was 5,595. Many thousands visited the hill, however, and more automobile parties than ever before availed themselves of the privilege of picnicking, using the tables and benches provided by the State for this purpose. Additional tables will be set up before another summer. The historical associations of the hill, the lovely view of Plymouth and Duxbury Bay, make it a very attractive spot to summer visitors and tourists.

STATE FORESTS

During the year 1932, 2,586.2375 acres were purchased for our state forests. These acres are distributed as follows:

<i>Name of Forest</i>	<i>Acres</i>
Beartown	99.65
Brimfield	10.
Chester-Blandford	420.
Clarksburg	234.15
Colrain	9.6
Conway	153.
Erving	313.2625
Harold Parker	16.69
Hubbardston	52.5
Otis	211.
Otter River	10.225
Peru	265.5
Pittsfield	91.44
Savoy Mountain	265.8
Shawme	70.
Shutesbury	75.
Wendell	235.
Willard Brook	53.42

2,586.2375

PART II.
REPORT OF THE DIVISION OF FORESTRY

The twenty-ninth annual report of the state forester is herewith submitted.
During the year we were obliged to make one change in our personnel, as Mr. Charles E. Mace was retired on September 2, 1932, by reason of age. His position was filled by a provisional temporary appointment of Michael J. Maroney, of Clinton, pending a civil service examination for the vacancy.

- ORGANIZATION
- WILLIAM A. L. BAZELEY, *Commissioner and State Forester.*
CHARLES O. BAILEY, *Conservation Department Secretary.*
ELIZABETH HUBBARD, *Head Clerk.*
HAROLD O. COOK, *Chief Forester.*
D. C. A. GALARNEAU, *Forester in Western Massachusetts.*
FRANK L. HAYNES, *Forester, Land Purchase and Surveys.*
JAMES MORRIS, *Forester, Nurseries.*
ROBERT B. PARMENTER, *Forester, Extension Work.*
MAXWELL C. HUTCHINS, *State Fire Warden.*
GEORGE A. SMITH, *Chief Moth Suppressor.*
JOHN P. CROWE, *Supervising Fire Warden.*

- District Fire Wardens
1. Lincoln Crowell, Sandwich
 2. William Day, Wareham
 3. John H. Montle, Fall River
 4. James E. Moley, Woburn
 5. Frederick R. Stone, South Sudbury
 6. Joseph L. Peabody, Winchendon
 7. Charles L. Woodman, Oxford
 8. Albert R. Ordway, Westfield
 9. Verne J. Fitzroy, Shelburne Falls

- District Moth Suppressors
1. Walter F. Holmes, Buzzards Bay
 2. Clarence W. Parkhurst, Wrentham
 3. Michael H. Donovan, Beverly
 4. John J. Fitzgerald, Haverhill
 5. Michael J. Maroney, Clinton
 6. Harry B. Ramsey, Worcester
 7. Grover C. Twiss, Holyoke

LECTURES

The foresters of the Division have given during the year, 72 lectures before various organizations. This number does not include those of the Extension Forester which are listed elsewhere in this report.

During the year the Commissioner attended the meeting of the Association of State Foresters in New Jersey and the Northeast Forest Research Council at New Haven, Connecticut. The department was represented by other members at the summer meeting of the New England Section, Society of American Foresters, held in Vermont, The New England Fire Chiefs' Club at Newport, Rhode Island, Forest Nurserymen's Conference at Syracuse, New York, Gypsy Moth Conference at Albany, New York, and Firewardens' conference at Stephentown, New York.

EXAMINATIONS

During the course of the year the chief forester and his assistants have visited the property of 83 owners and extended to them advice on the care of the woodlands or ornamental trees. The table summarizing these examinations does not give the whole story since many of our district men make casual examinations while out on other work of which they keep no record and the work of the extension forester along this same line is separately listed in his own report under the caption of "farm visits."

Problem	Number	Acres
Planting	25	439
Improvement Cuttings	22	2154
Marketing	3	173
Insects and Diseases — Woodland	8	661
Insects and Diseases — Ornamental Trees	25	
	83	3427

NURSERIES

During the drouth periods of 1930 and 1931 all tree stock in our transplant nurseries seemed to remain perfectly healthy. Frequent examinations were made of roots and buds and the stock went into the winter of 1931-1932 apparently in excellent condition. Through the winter, however, it became evident that the less hardy plants were dying, and when the shipping season opened we estimated that from 15 per cent to 20 per cent of our three and four year transplants were lost. A continued falling off in private sales offset this, however, so we were able to take care of practically all orders placed. We have a very limited number of two-year white pine seedlings. Hence, in 1934 we shall have very little of this species, but we should have plenty of red pine, three and four year transplants.

Distribution of the stock was approximately as follows:

Sale	553,000
Town forests	266,000
State Institutions and Departments	648,934
State Forests	1,065,000
	<hr/>
	2,532,934

STATE FORESTS

Arthur Warton Swann State Forest

This forest is carried on as an experimental tract and much of the work is done on definitely laid out sample plots from one-quarter acre to several acres. Through the assistance of an emergency crew of six men, ten and one-half acres of old pasture growth was leveled and cleared. Eight acres of experimental plantations were laid out and planted with a variety of tree mixtures and classes of stock. Release cutting of nine acres of regular plantation and six acres of experimental plantings was carried out. Experiments in the control of such insects as pine weevil and spruce gall were continued, and some re-eradication of *ribes* to protect the pine plantations from blister rust, was necessary. The forest roads and trails with a total length of eight miles were brushed and the bridge over the Lodge brook had to be rebuilt when heavy rains in the fall carried it away. The Winters house was repaired so that it could be occupied by the forester engaged to supervise the work on the Beartown and Sandisfield Forests.

Ashburnham State Forest

During the winter the regular crew of three men made some release cuttings on the Rockwood and Coughlin lots, and also carried on experimental pruning of crop trees in 20-year-old plantations on the Coughlin and Atherton lots. In March, six additional men augmented this crew, from funds provided by the Unemployment Act, and they did some thinning on the Crocker-Lyons lot and cleared about 25 acres of brush and weed-tree land on the Packard lot. When the planting season arrived, 10,000 spruce and 1,500 red pines were planted on the Packard lot; on the Crocker-Lyons lot, 10,000 spruce; on the Rockwood lot, 5,000 spruce; on the Holden lot, 2,500 spruce. When the planting work was finished the crew was reduced to two men who began a release cutting at the foot of Little Watatic Mountain. Here they found a considerable infection of blister rust, and the crew therefore spent some time in *ribes* eradication. During the fall the work was of a varied character. Water holes were enlarged, sphagnum moss gathered for the nurseries, and release cutting carried out on the Crocker reforestation lot.

Barre State Forest

An "unemployed" crew cleared about 40 acres of land burned in the 1929 fire and made it ready for planting and in the spring this area and some additional land was reforested with 50,000 white and 15,000 red pines. No other work has been done on this forest except that two men have been allowed to cut and remove dead wood. It is regrettable that this land is not near some center of population so that others might do this same work with benefit to themselves and to the department; for in this way we get the burned land cleared at no cost to us.

Brimfield State Forest

Three recent purchases have brought the area of this forest up to 1,560 acres. During the spring, largely with the help of the "unemployed" crew, about 20 acres of the Goodrich lot were cleared of grey birch and afterwards planted. Twenty-five acres of small crop growth on the Landen lot were thinned, 55,000 white pine and 5,000 red pine were planted on the Goodrich and Hoyt lands, and 1,000 red pine were set on the Jacques lot in Wales. About seven miles of forest road was brushed, one mile of which was rebuilt with stone and gravel and drained by the installation of five culverts. Most of the wood cut in the forest operations was of poor quality and unsalable. Some of it still remains on the lot, and some has been given away. Eighteen cords were sold, together with a few fence posts. During the summer the regular crew released the plantations on the Bramble, Hoyt, and Harwood lots, an area of 230 acres. Two new water holes were made, and five or six more are needed to give this forest proper fire protection.

Chester-Blandford State Forest

As a result of the relocation of the state highway between Huntington and Chester (Route 20) this forest now has a frontage of two and a half miles on this road. It seemed to offer a desirable opportunity to develop a motor camp ground similar to the one on the Mohawk Trail. A parking space has been made next to the highway and from it a road leads to an upper level back from the state road where the natural growth although rather small, has been thinned out, ten cement fireplaces built and two toilets installed. In order to make this site usable a great deal of work had to be done, grubbing out stumps and boulders. A spring was dammed and piped to the camp ground. The natural growth has been supplemented by planting of evergreens. Trails were laid out into the surrounding woodland and their effect enhanced by rustic bridges built over the brook. This development was made possible by the use of an "unemployed" crew during the spring and their work was supplemented by that of the crew of the district fire warden who worked on the camp ground at times during the spring and fall. A building to house emergency fire equipment was placed on this camp ground. The place has been much used and should it become crowded we have an opportunity to develop a second camp ground about a mile east of the present one. The red pine plantation of 25 acres located north and east of this camp ground was cleared of brush and a fire line plowed along the railroad right of way. A new tract of land which includes Sandersen Brook Falls was added to this forest during the year and some clearing of debris in the brook around the falls was done.

Colrain State Forest

A small crew of "unemployed" worked pruning the trees in a 21-year-old plantation of white pine at the north-east corner of the forest, covering an area of fifteen acres. In the summer the brush along the North Heath road and in the forest trails was mowed for a distance of about six miles.

Conway State Forest

In the spring an "unemployed" crew brushed out, from wall to wall, about six miles of abandoned town roads on this forest, and in the summer our crew from Goshen and Savoy supplemented this work by replanking bridges, taking out rocks and repairing culverts where necessary. The "unemployed" also cleared fifty acres of brush pasture, and this was later planted by the use of 40,000 spruce.

D. A. R. State Forest (Goshen)

An "unemployed" crew trimmed out roadsides on the Brier Hill and Rice roads, this cutting resulting in the production of 192 cords of wood, most of which has been sold. During the summer the regular crew of two men brushed out the trail to Mores Hill and cleared off the brush land near the summit to improve the outlook from this elevation. During the late summer and fall they were engaged in cutting out the boundary line to a width of fifteen feet. About two-thirds of the distance around the forest was completed.

Erving State Forest

During the winter the regular crew of three men, supplemented by members of our forest survey crew, made a release cutting in ten acres of red pine plantation back of the nursery, and continued the clearing of the burned forest area on the hill back of the Kurtz place. In the winter this forest was scouted for gypsy moths, and 525 egg clusters were found and creosoted, most of them near Laurel Lake. In March, 28 men were added to the force on this forest, and they continued the work of clearing the burned area and preparing it for planting. In all, 80 acres were so cleared. In the spring this area was planted with 32,000 red pine and 45,000 white pine. After the planting season the crew was reduced to three men, and they went to work on forest roads, brushing, fixing culverts, and removing rocks over a length of eight miles. In some cases the roads were relocated. In the late summer considerable work was done at the parking place at Laurel Lake. The forest road leading to the lake became so congested on Sundays and holidays that it was impossible to park the cars or even to turn them around. At the same time a boat landing was built, and some attempt made to improve the bathing facilities. A cement dam was built across the brook west of the nursery to create a water basin to be used in case of fire, and also to supply water to the nursery if needed. During the fall the crew released the plantation of 1931-32 on about 140 acres of the burned land on the hill back of the Kurtz place.

Federation of Women's Clubs State Forest

During March and April a small crew of "unemployed" carried on some thinning work along the roadsides and cleared about ten acres of brush land near the transmission line for planting and this area was planted with white pine and spruce. In carrying out this emergency work we had the cooperation of Mr. A. C. Cline, Assistant Director of the Harvard Forest who supervised the work.

In the summer a crew recruited from other forests improved the picnic grounds on the Bancroft place, building two stone fire places and stone seats and placing a curb around the two old wells. In September this attractive camp ground was the scene of the annual picnic of the State Federation of Women's Clubs when nearly 400 members were present.

In the fall a small crew spent a few weeks in brushing out about four miles of woods roads on this forest.

Foxborough State Forest

Most of the work on this forest was done by a large crew of "unemployed" in early spring. The Bennett and Wilkinson lots which were burned over in 1930 were cleared of brush and later this area was planted with 105,000 white pine and 5,000 spruce. Eight miles of roads were improved by removing rocks, putting in corduroy bridges and otherwise making them passable for fire trucks. Eight water holes were installed. During the fall a small crew released the plantations on the Keith lot, about 75 acres being so treated.

Harold Parker State Forest

During December the regular crew scouted for gypsy moth egg clusters. We are glad to report that they found comparatively few. In January and February they started to construct a new road from Salem to Haverhill, through the Osgood Hill section of the forest which has hitherto been inaccessible. When the "unemployed" men were taken on in March some of them were put to work completing the construction of this road. Another crew cleared off the thirty acres of burned over land east of Haverhill Street and small crews were given thinning work on other parts of the forest. Altogether 70 men were used on this forest. In April the burned land above referred to was planted with 25,000 spruce. Five thousand were set in the Brown lot on Marblehead Street and 2,000 near the garage. Much of the time of the regular crew was spent in May fighting fires in the region surrounding the forest. During the summer natural and planted stands of white pine were gone over for weevil and all forest roads and fire lines, about ten miles, brushed. During the fall the crew worked on the Osgood Hill road before mentioned and dug eight water holes in various parts of the forest.

Hubbardston State Forest

When the unemployment work started in March, a crew of six men were put at work on the Kendall lot, cutting grey birch and other weed trees. After two weeks this work was suspended on account of the condition of the roads, and the men were transferred to the Bishop lot, where similar work was carried out. In April 2,000 red pine and 10,000 white pine were planted on the Kendall lot, and 15,000 spruce on the Bishop lot. During the summer two men released 90 acres of planted land on the Kendall lot, and made some small repairs to the forest roads.

Leominster State Forest

During the winter the regular crew of four men made a thinning in a stand of young hardwoods on the south side of the Rocky Pond road, covering about eight acres. Late in February when the "unemployed" crew were taken on, the men from Leominster were put at work clearing old brush pasture land south of Rocky Pond road and about 40 acres were thus made ready for planting. A crew from Fitchburg made a heavy thinning on the east of the Paradise Pond road, so treating about 25 acres. In the spring 40,000 white pine were planted on the first mentioned area and 20,000 spruce and pine on the second.

After the planting the crew, now reduced to the regular number, mowed brush along the Rocky Pond road for a distance of three miles and made repairs by graveling and removing rocks over a stretch of two miles. The summer was spent releasing plantations on the Lucas, White, and Paradise Pond lots, about 175 acres, and brushing out forest roads on these lots to a length of five miles.

The fall was spent in thinning 30 acres of young hardwoods on the Fenno lots. The road to the Paradise Pond lot was gravelled, two bridges rebuilt, and a water hole with an approach road constructed on the Fenno land.

Martha's Vineyard State Forest

The work of clearing and plowing fire lines has continued during the year. These fire lines are 50 feet wide with a plowed strip about fifteen feet wide on either side. Three and one half miles were cleared and plowed and on one and one-half miles additional the brush only was cleared. Twelve miles of line previously constructed were harrowed. A new road was constructed from the headquarters house directly off the Vineyard Haven-Edgartown State Road. Planting was confined to the setting of 15,000 white spruce and 50,000 Scotch pine. Fifty acres of white pine plantation were released. Two wells lined with four-foot tiles to serve as a source of water for fire protection were dug. An attempt has been made to keep the white pine weevil from increasing on the island and all plantations, state and private, were scouted. We found nine infested tips on our own land and 86 on private plantations. Some papering and painting was done in both the headquarters and foreman's houses. The state forest crew assisted in extinguishing two fires, both on the forest.

Mohawk Trail State Forest

An emergency crew of fifteen men from North Adams paid from state highway funds cleared the underbrush and cut dead and unsightly trees for a distance of about four miles through the forest. At certain points clear cutting was resorted to in order to provide vistas up Cold River, Black Brook, Manning Brook and Wheeler Brook. This work was supervised by our district forester. At the same time an emergency crew of ten men from Florida and Charlemonst carried on a thinning operation in a 40-year stand of white pine on the north bank of Cold River opposite the camp ground. At the automobile camp ground a temporary dam was built across the river to make a bathing pool which was much appreciated by the campers. We hope some time to have funds enough to build a permanent dam at this point. The reservoir which supplies the camp ground was enlarged.

Mount Grace State Forest (Warwick)

The fire observer with the assistance of one man is employed on this forest at such seasons as there is no need for his services in the tower. These two men have constructed a very charming picnic ground in a picnic grove on the Gulf road, which contains three stone fire-places and tables. A small brook leading through

the picnic ground was dammed to make a wading pool for children. Two new water holes were constructed and two old ones were repaired. A release cutting was made on twenty acres of land planted some years ago with red and Scotch pines. New planting was limited to filling in small openings with 2,400 spruce.

Myles Standish State Forest

During the winter the regular crew released 50 acres of red pine plantation on the Mast Road addition and pruned the crop trees on 25 acres of white pine plantations near the headquarters.

The "unemployed" crew which came on in March were divided into two squads, one of which was put to work releasing 510 acres of red, white and Scotch pine plantations in the Fearings Pond section of the forest. The other squad was put to work on the roads. The cut-off road north of College Pond was regraded as also was the road to Widgeon Pond. One and one-half miles of road on the Ryan Lot was brushed out and six miles of road were re-mowed. Many recreational developments were carried out by the construction of two public camp sites, one on Charge Pond and the other on Long Pond, with fireplaces and toilets. The lower College Pond road was widened and graded from 12 feet to 25 feet for a distance of three miles.

During the planting season 100,000 white pine and 61,000 red pine were planted in the burned over section near Rocky Pond. Three hundred thousand two year red pine seedlings and 19,000 two year white spruce were transplanted into the nursery.

During the summer and fall the regular crew graded 12 miles of old 40-foot fire line and 13 miles of new fire line roads were graded for the first time.

Some 50 acres of woodland near Curlew, Widgeon and Rocky Ponds, badly infested with gypsy moths were sprayed and 60 acres of white pine plantations were gone over for pine weevil tips.

The old fire tower near the headquarters having become unsafe a new and higher one was erected. The telephone line to College Pond was moved from the west to east side road and made into a pole line.

The crew on this forest was called to extinguish with its equipment four fires, two on and two outside of the forest. Fortunately those on the forest were small.

Oakham State Forest

Thinning on the Fullam lot was continued in mixed pine and hardwood stands by use of an unemployed crew and this same crew thinned out a stand of 20 year old hardwoods on about ten acres of the Ames Lot. On the Jones lot our regular local crew during the summer released some 20 acres of pine, planted in sprout hardwoods. On the Oakham Forest 78½ cords of wood and 2,800 feet of lumber were cut and marketed.

October Mountain State Forest

During the winter the regular crew started work clearing out brush in and on the sides of several abandoned old town roads on the forest, and when the "unemployed" were taken on in March a number of these men were continued at the same work. The roads so treated for the first time were Ashley Lake, Monument, Farnham Dam and Pittsfield Plantation roads. At the same time the County, Bicycle, Watson, Finnerty Pond and Washington roads were widened by thinning the roadsides. The total length of road so treated is about 20 miles. Another crew of "unemployed" cleared off ten acres of brush pasture land which was later planted with 10,000 white spruce, and 15,000 more spruce were used to fill in on the Winters tract north of Becket road. During the summer a great deal of road repairing was done in the way of graveling, installing culverts, repairs to bridges, etc., especially on the Monument, Farnham Dam, Washington and County roads. On this last road the town of Washington cooperated in the work by supplying culverts and trucking assistance. The Tine road so-called near Yoakum Pond was also brushed and repaired and the town of Becket helped on this work. Regular upkeep was maintained by cleaning ditches and culverts, and grading was carried out on the Becket, Schermerhorn, and main roads. During the summer we opened up a camp ground near the site of the old Whitney mansion with three fireplaces,

tables and running water. This camp ground proved to be very popular. In connection with the public use of this forest it is interesting to learn that between 500 and 1,000 hunters visited the forest every day during deer week, and we are not so pleased to report that our men on patrol put out 68 camp fires during that week. Because of the depression in the lumber market no extensive logging job was carried on but we did cut 10,000 feet of ash and 2,000 feet of oak logs, which were sold. The roadside work above referred to resulted in the production of 130 cords of wood. During the fall, spruce and pine plantations on the main road, Bicycle road, Pittsfield plantation and the Gonseth place, covering an area of 175 acres were released. In March the old barn at headquarters which served as a storage for trucks and fire equipment was burned to the ground, and this was replaced with a wooden garage well adapted to the storage of our equipment. Practically all the lumber used in its construction was cut on the forest. At the Felton place the barn was painted, some of the sheds torn down and the remainder made over into a garage. At the headquarters house ceilings were whitened and wood work painted. A house was built over the spring that supplies water to headquarters. It is of interest to note in this report that our team of work horses won first prize for the third successive time at the Lenox Horse Show, thus securing permanent possession of the Vanderbilt cup.

Otis State Forest

On the Snow lot near White Lily Pond the land east of the town road was thinned out and the road frontage cleared up. On the Webb-Gorham lot the brush fifty feet back from the Otis-Monterey state road was mowed and several forest roads and trails were brushed.

Otter River State Forest

During the winter the regular two-man crew cleared out a combined boundary and fire line on the west side of the forest. The old railroad right-of-way was brushed out and later the ditches were drained converting it from a wet slough to a passable highway. In March an "unemployed" crew of ten men were taken on and put to work clearing brush from the Cotton Lot, an area about 40 acres and this lot was afterwards planted with 8,000 white, 11,000 red and 15,000 Norway spruce transplants. At the same time 300,000 seedlings were transplanted into the nursery. With the close of the planting season the crew was reduced to four men who spent much of their time during the summer in nursery work although some brushing in forest roads was done. In the fall the crew now reduced to two men worked on the camp ground at Indian Rock, built two fireplaces and toilets and made a parking space for automobiles. During the last month they spent most of their time release cutting some 100 acres of plantations in the northeast section of the forest.

During the year the forest crew responded to 18 forest fire calls, none of them on state land. Work on buildings was confined to reconstructing the chimney at the headquarters house.

Oxford State Forest

This is the smallest of our state forests with an area of 28 acres. The land situated on the summit of a hill was purchased primarily to serve as a site of a fire tower. It is covered with a young hardwood stand, chiefly oaks of twenty years growth. The entire area was given an improvement cutting and thinning by a crew hired under the emergency unemployment act. As a part of this thinning work, two sample acres were laid out on one of which all but the crop trees were taken out and in the second one, crop trees were marked, but only the trees which were crowding these crop trees were removed. Near the tower a camp ground with stone fireplace and tables together with parking space for several cars was constructed. The road into the tower and camping place was improved and gravelled.

Peru State Forest

An "unemployed" crew of eight men from Peru and Middlefield cleared the roadside brush and some of the forest growth on both sides of the old abandoned town road leading through the forest, and rebuilt two bridges. The authorities of

Middlefield cooperated by brushing the road and making repairs as far as the forest line. A set of old ruined buildings were burned and a camp built from the salvaged lumber. Thirty-five thousand spruce were set in abandoned fields.

Pittsfield State Forest

During March and April an "unemployed" crew of twenty men cleared the brush and dead wood on fifty acres of land burned over two years before and reforested this area with 50,000 spruce transplants. In the fall two men made repairs on the road to Lulu Cascade and Berry Pond, rebuilding one bridge over Cascade Brook, filling ruts and clearing ditches.

Sandisfield State Forest

During the summer on the Willetts Lot, 25 acres of Scotch pine plantations and 52 acres of Austrian pine were given release cutting. On the Karlson Lot 54 acres planted with Norway spruce, Scotch and Austrian pines, were given a similar treatment, and on the Tiffany lands near New Boston, six acres of spruce were liberated. During the summer and fall, three miles of old road on the Hoyt Lot were brushed out and a short stretch improved by graveling and installation of culverts. On the Tiffany Lot one mile, Willetts land, three miles, Hartshorn Lot, one-half mile and Karlson Lot, one mile of old roads badly choked with brush were cleared out. During the fall some planting was done, on the Hartshorn Lot with 7,500 Norway spruce, 1,900 red pine and 700 white spruce and on the Hoyt land with 6,000 white spruce and 3,000 Norway spruce.

Savoy State Forest

During the early spring an "unemployed" crew cut trees and brush on both sides of the Savoy Centre road and the road to Windsor Jambs for a distance of four and a half miles. About 68 cords of wood which was realized from this cutting was stacked and later sold. The small wood and brush was burned. During the summer the regular crew pruned 25 acres of pine plantation and released 25 acres of spruce plantation on the Thayer Lot. A new fire tower has been erected on this forest and the road leading to the tower has been gravelled and repaired. The grounds around the tower were cleared up. About four miles of forest road were given minor repairs by cleaning out ditches and culverts and filling in gullies.

Shawme State Forest (Bourne and Sandwich)

During the year there were three and one-half miles of new fire line constructed and 16 miles of old line were harrowed. Some five miles of new forest roads were brushed out and six miles of old road mowed. At the same time considerable work was done in removing large stones, and some grading was done in bad sections. Four miles of the boundary line were brushed out. Near the Forestdale road old dead snags, remains of old fires, were cut down on about 50 acres. Release cutting was carried on over 350 acres of older plantations. Spring planting included the setting out of 63,000 red pine, 54,000 Scotch pine, 6,000 Japanese Black pine, 3,000 Arbor Vitae, and 1,000 Norway spruce. Fifty acres of this planting is located near the junction of the Abbe road and the high tension line, and the balance near the canal, in the area burned in 1931. During the fall some experimental planting was carried on by the use of 2,000 European larch and 2,000 Japanese larch, 1,000 tulip poplar seedlings, and 1,000 Norway maples. At the same time a bushel of red oak acorns were set in scattered seed spots. We are trying to introduce some desirable hardwoods in those sections of the forest having heavier soils. This forest was unfortunate in suffering severely from fire in the spring. Three fires burned over 2,500 acres of land, but fortunately the section burned, the east half, had not so far been reforested except for 60 acres near the headquarters building, which was burned over. The forest crew assisted in extinguishing eighteen fires in seven towns on the Cape during the season. At the headquarters a new cesspool was built and the front piazza closed in to make a living room. During the spring the regular crew of four men had the assistance of twelve men taken on as a result of the unemployment appropriation.

Shutesbury State Forest

During the early spring two men made a release cutting of the plantations on the Cutter and Tillson Lots, and during the late spring, forest roads which had been rendered nearly impassable by trucking out lumber from neighboring land, were repaired. Work on this forest was suspended during the summer, but in the fall two men made repairs to an abandoned town road in the Macedonia section, one and one-half miles in length, and released natural pine reproduction on the New England Box Lot.

Spencer State Forest

Not much work was done on this forest during the year. In the experimental red pine plantation plots the trees previously pruned to a height of ten feet were pruned two or three feet higher, that is to the base of the live crown. Fir balsam Christmas trees to the number of 194 were cut and sold at an average price of fifty cents. This is the last cutting of the kind that can be made as the fir plantation has had its final thinning. On the Young Lot a road was built to the pond for fire protection and the dam at the outlet was repaired so that more water can be stored. Two thousand white pines were planted in openings on the lot and 220 chestnut posts were cut on the Dimock Lot and sold.

Sutton State Forest

A small crew of "unemployed" cleared ten acres of brush land which was later planted by the use of 10,000 white pines. The plantation of 1931 was given a release cutting.

Templeton State Forest

All the work on this forest was done on the Hadley-Aiken section. During the spring an "unemployed" crew of men cleared the brush on fifty acres of burned over land and this land was afterwards planted by the use of 7,000 spruce, 4,225 Scotch pine, 10,000 red and 32,000 white pines. In cooperation with the United States Forest Experiment Station an acre of Scotch pine, grown from seed raised in this country was planted for the purpose of testing its growth in comparison with the other Scotch pines grown from seed of European origin. During the summer two men released 80 acres of older plantations, built one new road one-half mile in length and made minor repairs to the old roads.

Tolland-Granville State Forest

During the winter the regular crew of two men supplemented in the spring by two others cleared 25 acres of brush pasture for planting and released ten acres of plantations. During the summer the regular crew made repairs to the main road leading to the headquarters house by cleaning ditches, placing five steel culverts and rebuilding one bridge. Roadside brush on ten miles of town roads was mowed and burned. On the Tolland section this work was done largely by the fire observer. Five additional water holes were dug and the camp ground at Hubbard River was cleaned up. Building repairs were limited to strengthening the ell of the Grannis House, papering and painting inside and a chimney was rebuilt at the headquarters house. There were no fires on our forest but the crew and its equipment worked on two fires in the Tuxis Forest in Connecticut which adjoins ours.

Warwick State Forest

When the Mount Grace forest fire observer and his assistant had finished work on that forest they were transferred to the Leason-Martin lands, where they cut out old apple trees and other misshapen trees in the plantations there. The old house on the Tyler place was torn down, the good lumber disposed of and the remains burned. Several acres of brush pasture on the Tyler place were cleared for planting and an old forest road brushed out for two and one-half miles.

Wendell State Forest

During the winter the regular crew of three men piled and burned pine slash on the Clark and Fay Lots. In March four men hired under the Unemployment Act were added to this crew and the same work continued until the middle of April when they planted 5,000 spruce, 5,000 red pine and 10,000 white pine on the Williams

Lot, 11,000 white and 9,000 red pines on the Fay Lot and 2,000 red and 3,000 white pines on the Ross Lot. After the planting work was completed the crew was reduced to three men and went to work on the roads and brush cutting and removing large stones. Two abandoned town roads in particular received attention, the road through the Fay Lot and the Kempfield road. In all ten miles of road were repaired and made passable for fire equipment. Two water holes on the Fay Lot and another on Dry Hill were built. The fall was devoted largely to releasing plantations on the Bartlett and Stone Lots, over an area of about 90 acres.

Westminster State Forest

This forest is made up of rather scattered small lots and no regular crew is maintained on it. In the early spring an "unemployed" crew of five men made a release cutting in one of the plantations and later planted a small area with 5,900 red pine and 100 Norway spruce. For a few days in the summer the Templeton-Hubbardston crew brushed out forest roads and made some small repairs.

Willard Brook State Forest

During the winter the regular crew of three men carried on logging work on the Blanchard Lot, cutting out dead chestnut, resulting in the production of 200 poles, 200 posts, and 10,000 feet of lumber. All this material was used on various state forests. An "unemployed" crew of seven men worked during March and April clearing 32 acres of brush pasture on the Hosmer place, and this land was later planted with 32,000 spruce and 1,000 arbor vitae. During June and July the regular crew worked on camp grounds improvements. Fifteen stone fireplaces and two toilets were built. At the upper camp ground a small dam was built across Willard Brook to make a wading pool. During August the crew worked on the Hosmer house to make it habitable for the superintendent. This work included new sills, draining the cellar, shingling and painting inside and out.

In the fall the crew released the plantations set out in 1930, about 20 acres, and cleared away the debris lodged along Willard Brook by the high water, resulting from heavy fall rains and repaired roads.

Windsor State Forest

A fifteen acre plantation of Jack pine which had been riddled by saw fly larvae was cut down and burned. In the hemlock grove at the Jambs dead trees were taken out and some light pruning carried out. The camp ground was patrolled on Saturdays and Sundays.

Worthington State Forest

One man during the fall thinned out a strip 50 feet wide along the state highway for a distance of one-third of a mile. This cutting had to be carefully done as it is planned to develop a portion of this area into a roadside camp ground because of its location and the presence of a very fine spring of water. Forty-five acres of spruce plantation were released.

STATE OWNED LOTS

Jones River, Kingston

In the early spring an "unemployed" crew of ten men from Kingston, Duxbury, and Marshfield released 75 acres of pine and spruce plantations. A 20-foot strip was cleared all around the boundary, and a mile of old forest road passing through the lot was cleared out. A fire coming from adjoining land burned over ten or twelve acres at the northeast corner of this property in the spring.

Rhea Lot, North Andover

An "unemployed" crew of six men from Georgetown, Newbury and Newburyport cut gray birch and other weed trees and pruned the pines on some ten acres of this lot. Later 6,000 spruce were planted in open areas.

Fullam Lot, West Brookfield

On this lot we followed the same system as that of the previous year, allowing local residents to go in and cut the poor hardwoods paying 50 cents per cord stump-age. In this way 177 cords of wood were disposed of. The department men later burned the brush. Two thousand white pine were planted in openings and the plantation of 1931 was released.

Glebe Land, Hopkinton

On this land five acres of burned land were cleared by an "unemployed" crew, and on the area so cleared 2,000 white pines were planted.

Fisk Lot, Buckland

Our "unemployed" crew brushed out two miles of forest roads and thinned a 20-foot belt on either side. Some 30 acres of pine plantation was released by cutting of gray birch and alders, and the pines themselves pruned to a height of six or eight feet.

Cape Cod Lots

The plantations on the LeClear Lot in Brewster, the Holway Lot in Sandwich, and the Crowell Lot in Dennis were given a release cutting.

Browne Lots, Marlborough

An "unemployed" crew of men from Marlborough and Sudbury made a thinning and release cutting on this lot, which covered about 18 acres.

Dewar Lot, Carlisle

In this operation a small crew of men from Carlisle and Chelmsford made a release cutting in planted pine covering about 14 acres.

Baker Lot, Bridgewater

An "unemployed" crew of men from Brockton and Bridgewater made a thinning and release cutting of about 20 acres of planted and natural pine stands on this lot.

French Lot, Lancaster

An "unemployed" crew of five men worked on this lot during the spring and cleared 20 acres of burned land for planting. This land was reforested with 20,000 white pine.

Hansen Lot, Marlborough

In March and April eight men in an "unemployed" crew released about 20 acres of planted pine of 15 years growth.

Present Acreage of State Forests

Nov, 30, 1932

<i>Name of Forest</i>	<i>Acreage</i>
Arthur Warton Swann	986.75
Ashburnham	1,530.555
Barre	582.125
Bash Bish	390.08
Beartown	7,713.43
Brimfield	1,609.8525
Campbell's Falls	2.6
Chester-Blandford	2,154.8
Clarksburg	2,098.15
Colrain	1,215.794
Conway	1,716.12
D. A. R.	1,020.
Erving	4,939.8275
*Federation of Women's Clubs	599.75
Foxborough	662.2412
Harold Parker	1,416.54
Hawley	2,410.7
Hubbardston	863.87
Huntington	441.
Leominster	1,890.3563
**Marthas Vineyard	4,472.75
Mohawk Trail	5,419.86745
Monroe	4,116.68
Mount Grace	1,065.825
**Myles Standish	8,869.
Northfield	235.4875
Oakham	828.55
October Mountain	13,802.6
Otis	3,412.81
Otter River	1,827.06
Oxford	28.7
Peru	1,973.5
Petersham	248.15
Pittsfield	1,247.28
Sandisfield	3,974.59
Savoy Mountain	8,669.18
**Shawme	8,370.12
Shutesbury	1,067.36
Spencer	650.525
Sutton	362.7715
Templeton	640.625
Tolland-Granville	4,682.25
Warwick	1,747.95
Wendell	5,244.85
Westminster	342.45
Willard Brook	643.88375
Windsor	1,450.05
Worthington	412.
Unassigned	1,093.325

121,144.7317

* In process of acquiring.

**Includes takings.

REPORT OF EXTENSION FORESTER

The forestry project has been undertaken during 1932 from a different angle. Heretofore it had been approached from the standpoint of cash income to enhance the current expenses. This year it was shown that if the methods recommended were carried out on the farm, the woodlot would take care of itself and it would not be necessary to expend any money for forest products, such as pea brush, bean poles, posts, bar rails, lumber, cordwood, etc., which are used on the farm.

The project started out with three major sub-projects:—

1. Planting.
2. Forest Weeding.
3. Thinning and Pruning.

As the work progressed, it was found expedient to add the following:

1. 4H Forestry Clubs.
2. School Forests.
3. Market Study.
4. Miscellaneous Activities.
 - a. Scout camps.
 - b. School forests.
 - c. Exhibits.

It was found necessary to include 4H club work for the juniors were clamoring for information about the forests; the school children also provided another source of helping the work through the establishment of school forests. The market study was undertaken because the woodland owners want to know where they can sell their products and the thinnings that are rather small for any known use. The citizens of the State are getting interested in the forests and continually ask for aid at scout camps, county club camps and also ask for exhibits.

The planting project was carried on in eight counties, the weeding project in nine counties, and thinning and pruning was successful in ten counties. The 4H forestry club work was a part of the program in six counties, and the market study and school forests were state wide projects.

The extension forester delivered 85 lectures to 5,936 people, attended 15 conferences with a total attendance of 1,463, made 65 farm visits, and held 12 demonstrations. This year there were 132,500 trees planted by 36 individuals, 83 co-operators thinned 673 acres of their woodland, 45 individuals pruned young pine on 537 acres and 39 men removed forest weeds from 413 acres. There were 20 forestry clubs and each one accomplished fine results. Outstanding results were obtained in Berkshire, Franklin, Hampden and Plymouth Counties.

The American Forestry Association Medals were presented again this year. The Tolland Forestry Club won the large plaque for the best piece of forestry work done by any forestry club in the State. They improved an area of pine, satisfactorily thinned and improved quarter acres on their own land, set out 2,000 red pine on their own land, 500 trees to each one, and have collected and mounted the required specimens, made a hypsometer, and learned how to make the Biltmore measuring stick in estimating standing timber.

Carleton Ryder of Barnstable won the small medal for the best forestry work of any individual boy in the State. He has successfully completed three years work and is entering his fourth. In addition to completing the first three years' requirements, he has practised weeding and thinning and pruning, studied fire control and methods used by the State to locate fires, made a simple plane table, and learned how to use it in mapping, and has completed a landscape map of his home grounds which he and his father intend to put into practice.

Barbara Whitman of Southwick won the girls' small medal. She led a club of eight. They collected 35 different specimens and mounted them for exhibition purposes. She has done such excellent work that this year she is leading a group of 20 members. She aided in the planting of ornamental trees about the homes of some of their neighbors, and has assisted in the thinning of a woodlot in Southwick.

The Extension Forester took a trip to the West Coast during the summer of 1932 in order to obtain some information in regard to the forest conditions in the west; how much timber was left; how fast it was being cut; and how long it was to be a factor in the eastern market and affect it for New England lumber.

The opinion of Dean Winkenwerder and Col. W. B. Greeley was that the west coast lumber would not be shipped to the Eastern seaboard in the form of raw

lumber and in such large quantities as heretofore. Fabricated lumber and building material would be shipped to the East in shapes that the trade want such as T's, Z's, crosses, ells, squares and rectangles. Many of the mills are closed and probably will not open because it will cost considerable to get them into shape. Some of the mills that commence sawing again will use the Swedish gangsaw. Most of the lumbering will be confined to an elevation not much above 3,000 feet. During the last few years the mills have not been cutting to capacity, and now they are cutting about 14 per cent of their capacity. The mills that are closed represent 25 per cent of the capacity of the industry, and many of these will never resume operations.

Good progress is being made in the utilization of mill waste for pulp stock and fuel. Many mills are shipping their waste to mills that have been established within a reasonable hauling distance. At Port Angeles, a large mill is only cutting the very best of the hemlock into lumber and the rest goes into pulp.

The loss shown in the lumber manufacturing has had beneficial results. So has the downward trend in lumber consumption. They are swinging the industry to concentrating on manufacturing and merchandising. The West Coast Lumbermen's Association are recommending the preparation and distribution of periodic authoritative balance sheets showing supply and demand relationships. They are also recommending the merging of the bulk of the mill properties into four or five operating units.

The Extension Forester did not see standing timber enough to keep the mills working for many years in the future. In many sections, the log supply was very limited and the situation was very acute. He saw so much territory absolutely denuded and with no reproduction, fire scarred areas entirely without hope of growing any timber for many years to come that he came to the conclusion that this section of the timber producing world would not be a menacing factor to the New England lumber market in the years to come.

County	PLANTING		WEEDING		THINNING		PRUNING	
	Trees	Cooperators	Acres	Cooperators	Acres	Cooperators	Acres	Cooperators
Barnstable.....	—	—	10	2	5	1	5	1
Berkshire.....	47,500	3	1	1	103	7	160	13
Bristol.....	—	—	—	—	7	3	—	—
Essex.....	—	—	19	2	5	3	76	8
Franklin.....	3,000	2	30	6	40	4	10	1
Hampden.....	5,500	4	12	4	12	6	—	—
Hampshire.....	2,000	2	5	1	6	4	—	—
Middlesex.....	20,000	8	10	2	25	5	—	—
Norfolk.....	2,500	2	—	—	—	—	—	—
Plymouth.....	6,500	4	323	18	450	40	283	21
Worcester.....	45,500	11	3	3	20	10	3	1
	132,500	36	413	39	673	83	537	45

REPORT OF THE FORESTER IN WESTERN MASSACHUSETTS

The following is a report of the forestry work conducted through the West Springfield office of the Division of Forestry during the fiscal year ending November 30, 1932.

With the continued courtesy of the Hampden County Improvement League, office space was provided without charge in its building at West Springfield.

Work on State Forests

Due to favorable conditions, the field season in connection with the forest type surveys on state forests was continued until the middle of January. Since it was advisable to complete the office work on the accumulated type data, the summer field season was started somewhat later than usual. All or the greater portion of the areas within 39 of the 48 established state forests and four unassigned parcels have now been typed. These areas comprise the major state-owned properties in the Western District and in Worcester County. In these same sections of the State, other lands remaining to be typed consist of newly purchased additions to state forests and lands for which boundary survey plans have not been available. In 1930, 783 acres were typed as a provision for the probable purchase of the area lying between the two blocks now forming the Clarksburg State Forest, and in 1931, sufficient ground was covered to allow for the proposed extension of the

Federation of Women's Clubs State Forest to 1,000 acres. During 1932, forest type surveys were completed on twenty-five parcels including all of the Huntington and Petersham State Forests; additions or lots assigned to Ashburnham, Blandford, Erving, Hubbardston, Northfield, Sandisfield, Templeton, Tolland, Warwick, and Wendell Forests; and unassigned lots in Fitchburg, Leverett, and Orange. The area typed was 3,457.12 acres making a total of 82,458.34 acres of state forest lands covered by original type surveys since 1924.

Field data relative to all classes of development work were gathered on 30 different forests and more was collected on others in connection with the regular type surveys. This information has now been secured on all typed areas. The kind, location and date of each class of development work will be shown by symbols on a transparent sheet placed over the colored type map of the respective forest area as a base, and since this will provide a permanent record of the progress of the development of the forest, it will be referred to as a "Progress Map."

The classification of the state forest areas according to types, based on the planimeter of the original forest type maps, was completed for all final surveys. The results based on 37,885.12 acres were previously reported, and this year 41,256.57 acres were similarly measured making a total of 79,141.69 acres classified by types. It was necessary to reclassify the "hardwood" and "old cutover" types in the previously reported results in order to make these conform to the new classification of these types. A summary of the type distribution is given in the following table.

Distribution of State Forest Areas According to Types Based on Planimeter of Forest Type Maps

<i>Type</i>	<i>Total Nov. 30, 1932 Acres</i>	<i>Per Cent of Grand Total</i>
Softwood	1,731.99	2.19
Softwood-Hardwood	3,382.25	4.28
Hardwood-Softwood	7,009.75	8.86
Hardwood	23,197.00	29.33
Plantation	4,207.23	5.32
100 per cent Open Land	1,968.10	2.48
50-90 per cent Open Land	2,366.77	2.99
Brush	4,394.31	5.56
Old Cutover	18,044.85	22.80
Recent Cutover	10,296.30	12.98
Burn	1,088.08	1.37
Swamp	361.06	.46
Water	396.74	.50
Roads	448.87	.57
Miscellaneous	248.39	.31
Totals	79,141.68	100.00

The type surveys have brought out some interesting facts relative to the major portion of the state forest lands in the Western District and Worcester County. Based on the total area already typed, the table shows that 44.66 per cent of the area contains timber of some kind. The 22.80 per cent of the Old Cutover may be rightfully classified as potential timber. The Recent Cutover 12.98 per cent, will eventually become timber but of better type and quality if given cultural treatment. The status of the so-called Brush area, 5.56 per cent, is problematical, and its future classification will depend upon its treatment. The relatively small amounts of Plantation, 5.32 per cent, and of Open Land, 5.47 per cent, refute the supposition that the state forests have been purchased largely for their extensive plantable areas. It is interesting to note that but 1.37 per cent was typed as Burn. The data gathered for the Progress Maps will probably alter the percentages in the table, but no great difference in any one type should result since the areas will be referenced to a relatively large grand total acreage.

An authorized trip was made to Connecticut to study the injurious work of the European Pine Shoot Moth on red pine and other two-needle pines. In accordance with instructions from your office examinations were made of fifty-five red pine plantations on our state forests and privately owned lands in Hampden, southern Hampshire, and southern Berkshire Counties. No evidence was found of the presence of the Shoot Moth.

Several timber plots were tentatively selected on state forests for the study of growth. It is proposed to choose on each plot of one acre a number of the most desirable trees which are to be left standing until they reach the age of about 100 years.

Careful measurements are to be made of each of these trees, and the measurements are to be repeated periodically. The plots are to be thinned and given future cultural treatment in order to provide the best growing conditions for the crop trees. Since the trees selected for observation are to be banded with blue paint, the areas are to be known as "Blue-Ribbon Plots."

This office was authorized to deal with the Appalachian Mountain Club in locating a section of the "Long Trail" through the October Mountain State Forest. This section of the trail was definitely located on the ground, and fireplaces are to be placed at each end of the trail within the forest and at Finerty Pond where a shelter is to be built by the club. A tentative plan was also made to locate and mark the original Indian trail within the Mohawk Trail State Forest.

EXTENSION FORESTRY

Demands for field examinations, advice, appointments, conferences, meetings, and cooperation from individuals, organizations, schools, towns, and cities were greater than in 1931. While there was a continued interest in planting, many requests were for advice and instruction in other phases of forestry practice. In a few cases there was a desire to extend forestry projects to include landscape or park developments, and a new interest was shown in recreational forestry. There was an increased number of requests for information regarding shade and ornamental trees and insects. One unusual demand concerned the construction of a swimming pool.

An interest in the pruning of white pine was indicated by the several projects carried out in privately owned plantations in the Western District, and pruning and girdling was completed on 34 acres of white pine in Dalton under the supervision of this office. In cooperation with the Northeastern Forest Experiment Station, two experimental pruning and girdling plots of one acre each were established in a white pine plantation owned by Mr. F. G. Crane, Jr., in Windsor. One was treated in the spring, the other in the fall. The purpose of these plots is to determine: first, whether spring or fall is a better time for pruning and girdling; second, whether the girdling-saw is a satisfactory tool to use on white pine; third, the effect of wind on girdled white pine.

Information concerning forestry practice in the Western District by agencies other than the State was supplied to the Northeastern Forest Experiment Station to be embodied in its report in connection with data for the "Copeland Resolution" which is to be presented at the next session of Congress.

In this district, towns and cities obliged to provide work for unemployed turned toward their town forests, watersheds, fire district lands, and parks. Considerable development on these areas resulted, and this office was asked for assistance in formulating plans for the continuation of this class of work during the coming year. Some work on town forests was conducted outside this district. Type surveys were completed on 109 acres of additional town forest lands in Walpole. Since a fire burned a large portion of the town forest in Sharon, it was necessary to re-type a block of 95 acres. Later, two type maps embracing all parcels comprising this town forest was submitted to the committee and suggestions were made as to work that might be undertaken with unemployed labor during 1933. A trip was made over the Plainville Town Forest with the chairman of the committee in charge, and possible work was designated on the ground. A map of that portion of the forest through which a new state highway passes was furnished to the Landscape Supervisor, Department of Public Works, who volunteered to assist the town with plans

for highway beautification. Work was also outlined for the Scituate Town Forest. A request for a survey of 75 acres of town forest land was received from Methuen. Since in the past, poor boundary maps caused difficulties in typing town forests, towns desiring this cooperation must now supply reliable boundary data before any type surveys are undertaken.

As is customary, the annual forestry exhibit at the Eastern States Exposition, September 18-24, was planned and constructed under the supervision of this office, and occupied the forestry wing of the Massachusetts Building. The motif of this year's exhibit was the work of the branches of the Division of Forestry.

An exhibit was installed at the Three County Fair, Northampton, October 3-5. The material was that included in the Forest Management and Moth Control displays at the Eastern States Exposition and two boxes of nursery stock.

Material was furnished to the Federation of Women's Clubs for an exhibit at Boston, and schools and libraries in this district were loaned forestry exhibits of different kinds. This was possible since material has been accumulated from various sources for the purpose of these "loan exhibits." Information relative to subject matter and construction of our forestry exhibits was furnished by request to the New York State College of Forestry, Syracuse, N. Y.

REPORT OF THE STATE FIRE WARDEN

MR. WM. A. L. BAZELEY, *State Forester*.

SIR:—In compliance with the provisions of section 26, chapter 48 of the General Laws, I submit herewith a report of the work accomplished by this branch of the division during the past year.

The 1932 fire season has been an exceptionally favorable one. Our reports show 1,293 fires, burning over 23,783 acres, with a damage of \$90,568 and a cost to extinguish of \$43,260. The only dangerous period was during the spring months as the heavy rains during the fall made it impossible for fires to start.

This is the first time in many years that we have not experienced some very serious fires during the fall months, some years the drought being so severe as to necessitate closing the hunting season for a period.

The most serious fire of the year occurred in North Reading, April 22, when 400 acres of forest lands and eighteen buildings were burned. This fire originated from burning rubbish in an open incinerator without a permit and a high wind caused it to spread rapidly.

Another serious fire was on our state-owned Shawme Forest in Sandwich where over 1,500 acres were burned within three hours. This fire was evidently set about one mile from the main road and with a high wind and no water, it was soon out of control. The damage was low as this is land that will be reforested within a very short period.

Our State power fire-fighting equipment has proved its value again this year. It has been used at a large number of fires with remarkable success.

Towns have not purchased the usual amount of additional equipment largely on account of financial conditions. As these conditions improve many towns will increase their equipment to the point where they will be able to take care of their own fires.

Over 200 towns established patrols on Saturdays, Sundays and holidays with good results preventing a large number of fires that otherwise might have been very serious. Large "Forest Fire Patrol" signs were furnished by this department for use on all patrol cars. I cannot emphasize too strongly the importance of such a patrol for all towns throughout the central and eastern portions of the State.

The Barnstable County patrol was carried on again this year with the usual good results. Two patrolmen were on duty patrolling 30,249 miles of road and interviewing 7,391 persons. They apprehended 21 violators and attended 75 fires.

We have received the hearty cooperation of town and State police in enforcing the cigarette law that carries a fine for the discarding of burning matches, cigarettes or smoking material from automobiles adjacent to forest lands. If we can reduce our losses from roadside fires we shall reduce our forest fire damages very materially as 26 per cent of our fires are from this source.

We have resumed holding our forest warden meetings again this year. Meetings

were held for Barnstable and Plymouth counties during November with practically every warden of these counties in attendance. These meetings will be continued throughout December and include the entire State. They are very instructive, giving the department officials an opportunity to get in direct touch with the wardens, and affording opportunity for discussion of their duties and the various laws under which they work.

We have had a very favorable year for tower construction and repair work. Several towers were repainted, telephone lines rebuilt and new poles and wires installed where necessary. During the month of November we constructed 100 hardwood tables for use at the various camping places on our State forests where we have several hundred holiday and week-end visitors. The old forest fire towers on the Myles Standish and Savoy State Forests were replaced by new 68-foot galvanized iron towers with 10x10 foot room at the top. These new towers are much higher than the former ones and will allow added protection to the surrounding forested area.

During the month of December Mr. H. N. Wheeler, Chief Lecturer of the United States Forest Service, delivered in this State thirteen lectures with pictures. These were given in conjunction with our association meetings and were well attended. Mr. Wheeler stressed the use of forests for recreational purposes, for production of wild life, and cover for watersheds. In view of the fact that Massachusetts furnishes summer playground for one million and a half visitors as well as for many of our own citizens, the preservation of these forests from fire and other losses is very important. I feel that Mr. Wheeler's cooperation has helped materially in building up interest in these important factors.

Our ten forest warden organizations throughout eastern Massachusetts have a total of about 1,500 members made up of forest wardens, deputy forest wardens and parties interested in forestry and fire prevention. Meetings are held monthly with generally one outstanding speaker and then an hour is devoted to the discussion of various fire problems. These organizations have been the means of building up the fire fighting strength in each of their counties and the results of their activities are already shown in the reduction of fire losses. This department certainly appreciates this good work and the untiring efforts of the officers in making these meetings a success. While on a trip through the New England states Chief Forester Major R. Y. Stuart of the United States Forest Service, Washington, D. C., visited the Minute Men's Association in district number five, commending very highly the work and the future possibilities of such associations.

Through the courtesy of the New England Association of Fire Chiefs we were privileged to take part in their annual convention held in Newport, Rhode Island, June 21 to 24 inclusive. Thursday, June 23, was set aside as Fire Warden's Day and was largely attended by the wardens of Rhode Island and Massachusetts. During the morning, addresses were made by A. F. Hawes, State Forester of Connecticut, A. B. Hastings of the United States Forest Service at Washington, D. C., E. B. Rideout, Radio Weather Expert, Boston, Harold O. Cook, Chief Forester of the Massachusetts Conservation Department and Kenne F. Williams of the Conservation Department, Albany, N. Y. During the afternoon, demonstrations were made of the various types of power forest fire fighting equipment furnished by the various States and private interests. The entire meeting was very instructive and had the approval of all in attendance.

We have recently located near the Beartown State Forest in Monterey a new one and one-half ton fire truck equipped with power pump and hose together with small fire fighting equipment. This will be used in assisting towns in their serious fires through southern Berkshire County and should prove of immense value to them. It will be in charge of men especially trained in handling fires. We have also located at our Wendell State Forest a similar outfit for use largely on that forest and throughout the surrounding towns. I am in hopes that we may be able to purchase a truck to handle equipment that we already have on the Mohawk Trail State Forest but for which we now have no means of transportation.

We have had a large number of convictions for the burning of brush without first securing a permit and for incendiary fires. Many parties have been fined and others have been sentenced to serve time in various institutions.

I desire to extend to the United States Weather Bureau at Boston, Mr. E. B. Rideout of WEEI and Mr. E. J. Rowell of WBZ my thanks for the forest fire weather forecasts given out by them daily during the fire season. This service was appreciated by all connected with the fire work.

We have again received the hearty cooperation of the United States Forest Service. Through them we have received under the Clark-McNary law \$29,397.87, our State allotment from this fund. I desire to thank Mr. C. R. Tillotson, their representative in this district, for his very valuable support in carrying on the work.

I also desire to extend to the men on our State Forests and the men associated with me in carrying on the fire work my sincere appreciation for their loyal support and cooperation.

The following tables show the comparative damages, costs, etc., for the past three years.

Respectfully submitted,

M. C. HUTCHINS,
State Fire Warden.

FOREST FIRES FOR THE PAST THREE YEARS

<i>Year</i>	<i>Number of fires</i>	<i>Acreage burned</i>	<i>Cost to extinguish</i>	<i>Damage</i>	<i>Average acreage per fire</i>	<i>Average damage per fire</i>
1930	1,922	72,988	\$122,478.00	\$309,662.00	37.97	\$161.11
1931	1,195	19,510	34,629.00	96,877.00	16.33	81.07
1932	1,293	23,783	43,260.00	90,568.00	18.39	70.04

TYPES OF CLASSIFIED DAMAGES

	<i>1931</i>	<i>1932</i>
Standing trees	\$26,771.00	\$34,096.00
Logs, lumber, cordwood	43,703.00	31,722.00
Buildings	22,587.00	15,377.00
Bridges, fences	87.00	10.00
Sproutland	3,729.00	9,363.00
Total	\$96,877.00	\$90,568.00

TYPES OF LAND BURNED OVER (ACRES)

	<i>1931</i>	<i>1932</i>
Timber	3,358	3,477
Second growth	6,657	3,962
Second growth, not merchantable	3,864	4,993
Brush land	3,729	9,363
Grass land	1,902	1,988
Total	19,510	23,783

FOREST FIRES FOR THE YEAR 1932

<i>Months</i>	<i>Number</i>	<i>Acreage burned</i>	<i>Cost to extinguish</i>	<i>Damage</i>
<i>1931</i>				
December	22	71	\$155.00	\$145.00
<i>1932</i>				
January	10	14	63.00	2.00
February	27	56	292.00	172.00
March	120	550	1,015.00	2,966.00
April	522	11,431	15,426.00	49,360.00
May	360	10,412	19,576.00	35,544.00
June	57	90	975.00	176.00
July	111	586	4,798.00	1,527.00
August	31	64	580.00	203.00
September	10	14	81.00	13.00
October	4	6	34.00	1.00
November	19	489	265.00	459.00
Total	1,293	23,783	\$43,260.00	\$90,568.00

CLASSIFIED CAUSES OF FOREST FIRES, 1931-1932

	Number	Per Cent	Number	Per Cent
Railroad	119	9.96	88	6.80
Smokers	407	34.06	418	32.33
Unknown	201	16.82	252	19.49
Brush burning	170	14.23	194	14.85
Incendiary	69	5.77	132	10.21
Children	163	13.64	147	11.37
Other causes	66	5.52	62	4.95
Total	1,195	100.00	1,293	100.00

RAILROAD FIRES FOR THE YEAR 1932

Railroad	Mileage of track	Number of locomotives	Number of fires	Acreage burned	Cost to extinguish	Damage
New York, New Haven and Hartford	1,861	963	34	150	\$518.00	\$1,298.00
Boston & Albany	967	322	10	148	213.00	1,306.00
Boston & Maine	1,923	777	40	362	632.00	775.00
Central Vermont	73	67	4	15	59.00	—
Total	4,824	2,129	88	675	\$1,422.00	\$3,379.00

REPORT OF THE SUPERINTENDENT OF MOTH WORK

MR. WM. A. L. BAZELEY, *Commissioner*.

SIR: Conditions over a large part of Massachusetts are good. The gypsy moth is not so prevalent as to cause noticeable stripping of woodland except in the Cape Cod, South Shore, and Bristol and Norfolk County Sections. In these excepted regions of the State, however, curtailment of appropriations has worked much havoc.

There was no defoliation in divisions three, four, five, six and seven this year, with the exception of the towns of Carlisle, Acton, Holliston, Hopkinton and Westwood; but almost all the towns in the above divisions show a large increase in the number of moth nests this fall. This means that if the cities and towns do not appropriate sufficient funds to do the necessary creosoting of the egg clusters this winter and to follow this work up with spraying next spring, there will be heavy feeding and defoliation during the coming year. The heaviest gypsy moth infestation this year was in southeastern Massachusetts and Cape Cod, where there were 200,000 acres that showed heavy feeding and stripping. We here append statements of the conditions prevailing in some of the worst infested towns in divisions one and two.

Division 1

Barnstable. The infestation was severe in all parts of this town, on account of a cut in the appropriation in moth work. There was not enough creosoting or spraying done to hold the moths in check.

Bourne. There was a big increase in the gypsy moth infestation in the town this year. Very heavy defoliation in the woodland.

Brewster. Conditions were very bad here this year. A large percentage of the woodland was defoliated. The spraying was confined to the roadsides, and a very small amount of private spraying was done.

Bridgewater. There was heavy feeding here this year, especially in the eastern part of the town where large areas were defoliated. Inspection this fall shows that a large amount of work will have to be done during the winter and spring to hold the infestation in check.

Carver. The gypsy moth infestation was very severe here this year, the worst in several years, and much damage was done to the cranberry bogs. Heavy defoliation will occur here next year unless a large amount of work is done this winter and spring.

Chatham. Conditions continue bad. Large sections of the woodland were defoliated during the past summer. The appropriation is not sufficient to do moth work as it should be done. The supervision is not the best.

Dennis. The gypsy moth infestation was quite severe in several sections of the town this year and there was heavy defoliation in the woodlands. The roadsides are kept in good condition.

Duxbury. The gypsy moth has become extremely prevalent in this town. Large

areas of woodland were defoliated during the past summer. Heavy nesting is noticeable this fall.

Falmouth. The town was badly infested this year. Most of the woodland and back roadsides were defoliated. The moth appropriation was reduced which was a grave mistake.

Halifax. There was a severe infestation in some sections this year. The roadsides and residential sections were kept in good condition, but some of the woodland showed heavy defoliation.

Harwich. Conditions were bad here last summer. There was heavy defoliation in the woodlands and some in the residential sections. The town should appropriate its full liability this year.

Kingston. The moth infestation was very severe in some sections of the town and much defoliation was noticed. Very little spraying was done on account of the reduction in the appropriation. There are quite a few brown-tail moth webs noticeable this fall.

Lakeville. There has been a decided increase in the gypsy moth this year. The residential section was kept in good condition but several areas of woodland were defoliated and inspection this fall shows very heavy nesting.

Marion. The infestation here is about the same as last year, mostly confined to the eastern part of the town. Considerable defoliation was noticeable in the woodland.

Marshfield. The infestation here has shown a marked increase over last year. Stripping took place in the woodland for the first time in several years.

Mashpee. Moth infestation was the most severe ever reported from this town. Practically all the woodland and many of the roadsides trees were defoliated. Much damage was done to private property. One reason for this was that the town had reduced its moth appropriation.

Mattapoisett. Moth conditions are growing worse this year. Several woodland areas were defoliated during the summer. The town makes only a small appropriation for creosote work and no spraying is done.

Middleborough. There was a very heavy defoliation in the town this year, especially in the woodland. Considerable damage was reported from the cranberry bog owners and requests for spraying were very numerous so the town did not have a chance to do any woodland spraying.

Orleans. There was heavy infestation in the woodlands in the southern and western parts of the town. Large areas were defoliated. The roadside trees and residential section were kept in good condition.

Pembroke. The gypsy moth infestation was very heavy in the woodlands in this town. Considerable defoliation was noticeable around several lakes in the vicinity of summer cottages. Where spraying was done along the roadsides and on private property conditions were good.

Plymouth. Conditions have been very bad in this town for several years past. Woodlands have been defoliated in all sections of the town. It took all available funds and equipment this year to care for the shade trees and travelled roads.

Plympton. Infestation was very bad in the woodlands in the southern part of the town. The main highway and the residential sections were in good condition.

Rochester. Conditions were very bad this year. Defoliation was noticeable in the residential section as well as in the woodlands. For several years the town has not appropriated sufficient funds to do the moth work properly.

Sandwich. Moth infestation in the woodlands was the most severe in several years. Thousands of acres were defoliated. The main highways and residential sections were kept in good condition.

Tisbury. The moth infestation in this town has been greatly reduced in all areas known to be affected, and no new colonies have been found this fall. All known colonies were sprayed. Very little feeding was noticeable. Much credit should be given to owners of large estates who did a great deal of work to keep the moths in check.

Wareham. The infestation was severe again this year. Large areas of woodland were defoliated in all sections of the town. Inspection this fall shows that the infestation is still heavy. This town has not spraying equipment adequate to cope with the situation.

Yarmouth. Gypsy moth conditions were bad over much of this town, mostly in the woodlands. Large areas were defoliated. The residential sections, however, were kept in pretty good condition.

Division II

Acushnet. About two thousand acres were defoliated in this town during the past summer. The inspection this fall shows that there will be as much, if not more next season unless the town makes a larger appropriation than it did in 1932, which was only one hundred dollars. They should appropriate one thousand dollars to do the work properly.

Berkley. Gypsy moth defoliation this year covered about two thousand acres. It is very hard to hold the moths in check in this town as it is mostly woodland; however, inspection this fall indicates that conditions will not be as bad next year.

Dighton. About seven thousand acres were defoliated this year. Unless a lot of moth work is done this winter and spring conditions will be as bad as they were this year. This town does not appropriate funds enough to do the work properly.

Fall River. Defoliation took place over about fifteen thousand acres, wholly or in part, during the past year. The fall inspection indicates that there will be some feeding here next year, but not as much as in 1932. This city cut this year's appropriation in half.

Franklin. During the year 365 acres were defoliated in this town as compared with none last year. The defoliation will be greater next year unless much work is done during the winter and spring. In 1932 only four hundred dollars was appropriated for moth work which was not sufficient. Next year fifteen hundred dollars should be raised.

Freetown. The moth infestation here was very severe this year, about 12,000 acres being defoliated. Indications are that stripping will not be as heavy next year.

Norton. There was a large increase in moth infestation in this town, about 1,000 acres being defoliated as compared with none last year. The five hundred dollar appropriation did not begin to take care of the work.

Rehoboth. Moth infestation was very severe here this year. The entire wooded area of 20,000 acres was defoliated. The appropriation of one thousand dollars was not sufficient to keep the moths in check.

Swansea. About 1,100 acres were stripped this year compared with none last year, the town having appropriated one hundred dollars for moth work. It would take two thousand dollars to do the work properly.

Taunton. The infestation in this city was very severe this year, about 8,000 acres being stripped. Inspection this fall shows a very heavy egg deposit.

Westport. There was a large increase of gypsy moths in the southern and eastern parts of this town. The summer colony at Cadman's Neck complained about moth conditions there. The woodland was defoliated. The moth appropriation was reduced to three hundred fifty dollars, which was not sufficient. The town should appropriate at least one thousand dollars.

Westwood. There was a large increase in gypsy moth infestation here this summer, especially in the western part of the town where 400 acres were defoliated. There will be a great deal more damage done next year unless a large amount of work is accomplished during the winter and spring.

The brown-tail moth and the satin moth have not been as prevalent this year as last, but the elm leaf beetle, as we predicted, has been very numerous and has done much damage. The fall web worm has been very bad in all sections of the State, and also the tent caterpillar. The oriental hag-moth is spreading to some extent.

The North Shore work has been carried on as usual, spraying, creosoting and brush cutting being done in season. There was no defoliation or heavy feeding noticed. The reason for this good condition is that intensive work is carried on, every acre of the 3,700 involved is gone over carefully each year, and any bad spots are treated by rough creosoting followed by spraying in the spring. This work is entirely supported by voluntary contributions now, and has been for some years. The North Shore Committee, under the management of Wm. D. Sohler, City of Beverly and Town of Manchester, cooperate in carrying on this work.

Following this report are special reports from A. F. Burgess, in charge of moth work of the Federal Government, and C. W. Collins, Senior Entomologist for the United States Department of Agriculture, in charge of the laboratory at Melrose Highlands, Massachusetts.

Respectfully submitted,

G. A. SMITH,
Superintendent of Moth Work.

FEDERAL GYPSY MOTH AND BROWN-TAIL MOTH WORK
IN MASSACHUSETTS.

By A. F. Burgess.

No change has been made in the quarantine effecting the gypsy moth, the brown-tail moth and the satin moth during the current year. In the case of the satin moth no spread of the insect has been noted in Massachusetts although the State is rather generally infested except for a few towns in Berkshire County. This pest was not as abundant as usual this year but it is readily controlled by spraying with arsenate of lead. This treatment which is applied for the gypsy moth to many of the trees in residential sections takes care of the satin moth without additional work.

The materials that must be inspected before passing out of the quarantined area have been somewhat less than was the case last year as there has been a shrinkage in shipping of all kinds throughout the State. Small orders have been more common than usual, however, so that there has not been a large decrease in the number of shipments that had to be examined.

Defoliation by the gypsy moth was extremely severe over enormous areas particularly in Plymouth, Bristol and Barnstable counties. There was also more defoliation this year than during the past year in Maine, New Hampshire and in isolated sections of Rhode Island and eastern Connecticut. The total amount of defoliation for New England aggregated 40 per cent increase over that of the previous year, the proportion being considerably larger in Massachusetts.

The work in the barrier zone was curtailed about July 1, owing to a sharp reduction in the funds available. The Federal gypsy moth work was discontinued in New Jersey July 1, as the insect is considered to be exterminated in that State. Late in July, however, a heavy infestation was found near Pittston in northeastern Pennsylvania, and funds had to be diverted from the barrier zone in order to begin work in that location. Cooperation has been secured with the State of Pennsylvania and plans have been made to exterminate this colony. Infestation has been found in an area of over 100 square miles and the territory where work will have to be done will cover a much larger area. This has made it necessary to further decrease the work in the barrier zone and only a moderate amount of scouting and treatment work has been carried on in the most dangerous sections of the zone in southwestern Massachusetts and northwestern Connecticut since July 1.

Assembling cages used in this section of the zone during mid-summer attracted more male moths than was the case during the previous year and in the territory directly east of this portion of the zone the number of male moths caught was almost double the record of the previous year.

Reports that are available up to the present time, based on egg clusters noted in the field, seem to indicate that gypsy moth infestation is increasing. The brown-tail moth was somewhat more abundant than usual throughout the New England territory in the spring of 1932, and although large numbers of webs were cut and burned there appeared to be a slight increase after mid-summer when the new webs had been made by the small caterpillars. A number of webs have been reported in towns as far north as Conway, New Hampshire, and in a few towns along the Connecticut River in that State. Apparently the insect is increasing somewhat and is showing a tendency of spreading to localities that have not been reported as infested in recent years.

NATURAL ENEMIES OF THE GYPSY MOTH, BROWN-TAIL MOTH AND A FEW
OTHER PESTS IN MASSACHUSETTS

C. W. Collins, U. S. Bureau of Entomology.

The usual summer collections of larvae and pupae of the gypsy moth were made in the infested New England area, including Massachusetts, during the summer of 1932 and recent compilations show that of the important parasites issuing from these stages, there was a slight decrease in percentage of parasitism by *Apanteles melanoscelus* Ratz. in comparison to that of 1931, but there was a large increase by *Compsilura concinnata* Meig. There was a decrease in the percentage of parasitism of the pupae in 1932 by *Sturmia scutellata* R. D. but there was a considerable increase in the number of larvae and pupae destroyed by the predator, *Calosoma sycophanta* L. over that in 1931. In general the natural enemies of the gypsy moth larvae and pupae showed some increase in 1932 over 1931. Gypsy moth eggs collected for

parasitism in the fall of 1932 have not yet been examined. More intensive defoliation was observed in Barnstable, Plymouth and Bristol counties in 1932 than 1931. Judging from the conditions existing there and the increase in parasitism noted in 1932, one would expect that considerable relief would be afforded by parasitism in 1933 in this same general area.

Approximately 47,000 adults of *Phorocera agilis* R. D., a tachinid parasite of the gypsy moth that issued in the spring of 1932 from puparia received from Europe in 1931, were liberated. The species was again recovered from a locality where it was put out in 1927 and 1928, but only in small numbers. About 2,400 adults of *Sturmia inconspicua* Meig. and 1,500 adults of *Carcelia separata* Rond., both tachinid parasites of the gypsy moth, were also liberated as a result of shipments received from Europe during the summer of 1932.

In Massachusetts the brown-tail moth continues to be a pest in a few localities in the northeastern part of the State. Collections of hibernating larvae from all parts of the State in the winter of 1931-32 showed an increase in parasitism over that of 1931, especially by *Apanteles lacteicolor* Viereck. The full grown larvae collected during the summer showed a large increase in parasitism, due to *C. concinnata* Meig. and *Meteorus versicolor* Wesm.

Field collections of satin moth larvae indicate that two hymenopterous parasites, *Eupteromalus nidulans* Thoms. and *Apanteles solitarius* Ratz., introduced from Europe, have become rather important enemies of this pest and have played an important part in the general reduction in intensity of infestation during the last few years.

Results obtained from the introduction and liberation of *Chaetoxorista javana* B. & B., a tachinid parasite of the Oriental Moth, secured from Japan in 1929 and 1930, have been encouraging. Collections of cocoons of this moth made during the spring of 1932 indicated parasitism ranging from 1.5 to 42.1 per cent, or an average of 16.5. Similar collections during the fall of 1932 indicated that the range of parasitism was from 24 to 90 per cent, or an average of 52.4. As a result of this increasing parasitism, a general reduction in the intensity of infestation of this insect pest is being noted.

The importation from Europe of parasites of the gypsy moth and some other forest insects is being continued.

APPENDIX

FINANCIAL STATEMENT

Receipts and Expenditures for Year ending November 30, 1932

Purpose of Appropriation	Amount	Balances	Net Expenditures	Balance to 1933	Balance to Treasury
Salary of Commissioner	\$6,000.00	—	\$6,000.00	—	—
Expenses of Commissioner	125.00	—	70.94	—	54.06
Administration—Services	1,914.00	—	1,879.35	—	34.65
Administration—Expenses	2,561.00	*\$9.77	2,570.77	—	—
Personal Services	15,000.00	—	14,164.89	—	835.11
Office Incidentals	7,600.00	—	7,598.88	—	1.12
General Forestry and Nurseries	14,500.00	—	13,154.29	—	1,345.71
Purchase and Planting of Forest Lands	2,000.00	—	1,853.12	—	146.88
Maintenance of State Forests	20,000.00	—	19,998.38	—	1.62
Prevention of Forest Fires	61,000.00	—	61,000.00	—	—
Protection against Forest Fires	750.00	**130.30	878.66	—	1.64
Reimbursement for Fighting Forest Fires	1,000.00	—	—	—	1,000.00
Suppression of Gypsy and Brown Tail Moths	55,500.00	178.71	55,378.07	300.64	—
Purchase and Development of State Forests	134,500.00	1,453.21	135,575.83	377.33	—
Maintenance of Standish Monument	1,900.00	—	1,897.72	—	2.28
Maintenance of Mount Grace	450.00	—	449.75	—	.25
Land for Willard Brook	14,738.21	4,927.16	19,665.37	—	—
Special Forest Lands Improvements	110,000.00	—	109,999.69	—	.31
Barnstable County Fire Patrol	3,000.00	—	2,770.34	—	229.66
Federal Forestry Fund—Nurseries	—	3,287.49	388.07	2,899.42	—
Federal Forestry Fund—Fires	—	33,970.51	24,886.94	9,083.57	—
Purchase of Salisbury Beach	—	50,000.00	—	50,000.00	—
	\$452,538.21	\$93,957.15	\$480,181.11	\$62,660.96	\$3,653.29
Division of Parks	8,300.00	*4.84	8,304.84	—	—
	\$460,838.21	\$93,961.99	\$488,485.95	\$62,660.96	\$3,653.29

*Brought from appropriation for "Small Items."

**From deficiency appropriation.

**STATEMENT OF EXPENDITURES AND RECEIPTS ON STATE FORESTS FOR THE YEAR
ENDING NOVEMBER 30, 1932**

	Planting Nursery	General Upkeep, Fire Lines, Roads	Surveying and Titles	Land	Total	Receipts
Arthur Warton Swann	\$157.21	\$1,958.34	—	—	\$2,115.55	\$39.00
Ashburnham	157.50	2,525.25	\$448.45	—	3,131.20	35.75
Barre	110.00	274.00	—	—	384.00	15.87
Bash Bish	—	—	—	—	—	—
Beartown	—	752.32	109.00	\$568.25	1,429.57	—
Brimfield	93.00	3,220.25	643.08	45.00	4,001.33	51.25
Campbell Falls	—	—	1.45	—	1.45	—
Chester-Blandford	—	3,479.28	395.55	3,425.00	7,299.83	—
Clarksburg	—	76.00	114.21	1,170.75	1,360.96	—
Colrain	—	80.00	20.04	48.00	148.04	—
Conway	—	658.55	104.60	765.00	1,528.15	25.00
D. A. R.	—	1,810.00	—	—	1,810.00	452.00
Erving	567.21	3,742.15	193.58	2,180.00	6,682.94	74.00
Fed. Wom. Clubs	—	286.89	10.70	—	297.59	—
Foxborough	—	1,328.96	—	—	1,328.96	121.25
Harold Parker	35.00	4,480.90	2.13	83.47	4,601.50	410.50
Hawley	—	—	—	—	—	36.70
Hubbardston	—	815.50	44.06	300.00	1,159.56	42.00
Huntington	—	—	—	—	—	—
Leominster	133.00	3,600.20	16.00	—	3,749.20	303.00
Marthas Vineyard	212.97	6,467.44	27.20	—	6,707.61	52.50
Mohawk Trail	—	3,894.76	539.42	—	4,434.18	246.45
Monroe	—	4.75	44.50	—	49.25	—
Mount Grace	—	279.45	96.00	—	375.45	43.06
Myles Standish	855.00	8,957.38	86.50	—	9,898.88	2,203.00
Northfield	—	238.45	20.00	—	258.45	—
Oakham	—	491.20	2.04	—	493.24	183.75
October Mountain	117.25	15,432.22	37.00	—	15,586.47	761.96
Otis	—	146.60	77.35	633.00	856.95	—
Otter River	365.10	2,652.16	281.93	51.15	3,350.34	123.00
Oxford	—	1,271.05	—	—	1,271.05	2.00
Peru	2.47	—	458.35	1,153.50	1,614.32	20.00
Petersham	—	110.80	10.00	—	120.80	—
Pittsfield	—	502.50	207.10	507.50	1,217.10	—
Sandisfield	198.71	708.61	10.00	—	917.32	70.00
Savoy Mountain	—	1,071.98	254.20	1,934.00	3,260.18	803.35
Shawme	627.48	4,100.16	70.24	140.00	4,937.88	143.60
Shutesbury	—	521.60	113.03	375.00	1,009.63	—
Spencer	38.00	507.75	—	—	545.75	118.00
Sutton	37.50	303.00	—	—	340.50	21.00
Templeton	84.00	599.06	12.04	—	695.10	—
Tolland-Granville	—	3,844.82	—	—	3,844.82	92.50
Warwick	12.00	181.13	153.00	—	346.13	3.00
Wendell	231.00	3,522.74	1,346.04	900.00	5,999.78	74.00
Westminster	—	124.00	120.00	—	244.00	—
Willard Brook	120.75	3,691.71	206.00	19,665.37	23,683.83	31.00
Windsor	—	80.00	—	—	80.00	85.00
Worthington	—	240.00	—	—	240.00	—
State Owned Lots	—	—	—	—	—	53.00
Fullam, W. Brookfield	—	—	—	—	—	86.89
French, W. Brookfield	—	—	—	—	—	—
Glebe, Hopkinton	—	—	—	—	—	—
Rhea, North Andover	—	—	—	—	—	25.00
	\$4,155.15	\$89,033.91	\$6,274.79	\$33,944.99	\$133,408.84	\$6,848.38

Receipts, 1932

For cordwood	\$3,017.72
" loam and gravel	220.80
" berries, etc.	145.00
" lumber, posts, etc.	587.56
" Christmas trees	102.75
" press brush	119.55
" camp sites and rentals	2,433.00
" miscellaneous forest products	222.00
" receipts at Standish Monument	594.12
" trees sold	6,046.09
" examinations	20.00
" income under will of L. M. Standish	149.09
" forest fire supplies, etc.	445.52
" reimbursement from Barnstable County	1,492.18
" gypsy moth supplies	109.03
" interest on bank accounts	83.32
" insurance for damage to car	10.00
" books and maps sold	49.50
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	\$15,847.23

THE DISTRIBUTION OF SUPPLIES

Supplies have been furnished as usual for gypsy moth work to such towns as we could assist with our limited appropriation. We have also purchased supplies for forestry and forest fire work.

List of Supplies Furnished in 1932

Ashby	\$161.28	Middleton	\$138.69
Berkley	305.70	Newbury	526.28
Berlin	239.75	North Reading	431.69
Bolton	332.54	Northborough	521.07
Boxborough	272.06	Norwell	300.07
Boxford	199.12	Pembroke	602.44
Boylston	243.51	Plainville	60.94
Brewster	309.23	Plympton	183.43
Chilmark	223.97	Rowley	585.02
Dennis	485.19	Sandwich	776.29
Dunstable	329.58	Shirley	364.68
Eastham	142.08	Sterling	104.71
Freetown	287.08	Truro	113.69
Georgetown	431.43	Tyngsborough	776.66
Halifax	484.97	Wellfleet	26.90
Lakeville	161.44	West Bridgewater	309.73
Lunenburg	322.64	West Newbury	133.25
Lynnfield	305.44	West Tisbury	228.57
Mashpee	229.53		<hr/>
			\$11,650.65
Automobile Supplies			\$329.11
Forest Fire Patrol			40.70
General Forestry and Nurseries			111.18
Maintenance of State Forests			241.19
North Shore Special Work			34.31
Prevention of Forest Fires			817.78
Purchase and Development of State Forests			378.35
Special, Forest Lands Improvements			6.81
			<hr/>
			\$13,610.08

**STATEMENT OF EXPENDITURES AND REIMBURSEMENTS OF TOWNS AND CITIES FOR
THE YEAR ENDING NOVEMBER 30, 1932, ON ACCOUNT OF GYPSY MOTH WORK**

Cities and Towns	1932						1933
	Required Expendi- ture	Total Net Expendi- ture	Private Work	Reimburse- ment	Supplies Furnished	Total Amount Received from State	Required Expendi- ture
Ashby	\$467.44	\$566.68	\$62.46 *143.16 }	\$99.00	\$161.28	\$260.28	\$412.48
Berkley	385.82	826.03	147.00	436.33	305.70	742.03	360.84
Berlin	427.74	535.04	12.00 *80.00 }	100.00	239.75	339.75	427.60
Bolton	532.95	553.92	37.00 *311.28 }	—	332.54	332.54	493.55
Boxborough	154.82	155.04	*259.16	—	272.06	272.06	150.71
Boxford	545.79	751.77	237.63	194.70	199.12	393.82	461.38
Boylston	350.02	650.17	168.00 *42.00 }	299.80	243.51	543.31	371.90
Brewster	820.31	920.71	307.56 *3.00 }	100.00	309.23	409.23	868.41
Chilmark	264.02	838.83	—	528.13	223.97	752.10	284.78
Conway	404.97	453.88	34.00	45.60	—	45.60	419.71
Dennis	1,408.82	1,787.07	25.00	—	485.19	485.19	1,410.71
Dunstable	213.44	313.44	137.36 *204.12 }	100.00	329.58	429.58	189.86
Eastham	503.69	653.69	115.93	150.00	142.08	292.08	502.26
Freetown	886.96	1,111.96	170.50	225.00	287.08	512.08	675.44
Georgetown	818.53	1,090.07	636.25	250.00	431.43	681.43	763.95
Halifax	636.38	925.71	472.18 *47.56 }	150.00	484.97	634.97	639.17
Lakeville	675.57	825.82	147.50	100.00	161.44	261.44	569.84
Lunenburg	1,018.79	1,812.21	588.80	200.38	322.64	523.02	933.37
Lynnfield	1,360.09	1,560.32	237.82	200.00	305.44	505.44	1,479.23
Mashpee	413.66	516.00	84.00	100.00	229.53	329.53	346.35
Middleton	709.54	693.73	92.20	—	138.69	122.88	800.77
Newbury	1,013.28	1,111.03	884.81 *312.34 }	97.75	526.28	624.03	909.50
North Reading . . .	956.16	1,501.50	778.00	386.00	431.69	817.69	971.39
Northborough . . .	914.15	1,320.57	271.15 *216.48 }	399.20	521.07	920.27	876.67
Norwell	861.02	785.83	528.40	—	300.07	224.88	865.73
Oakham	225.87	326.80	75.00	99.00	—	99.00	181.08
Pembroke	1,187.86	1,288.06	307.35	100.00	602.44	702.44	1,195.65
Phillipston	193.15	543.80	26.00	299.60	—	299.60	150.70
Plainville	743.67	1,035.17	108.50	200.00	60.94	260.94	696.05
Plympton	311.91	603.04	136.72	100.00	183.43	233.43	297.84
Rowley	685.56	1,108.53	397.50 *271.86 }	421.30	585.02	1,006.32	569.42
Sandwich	1,127.89	1,395.72	139.40 *75.70 }	150.00	776.29	926.29	1,137.50
Shirley	1,000.97	1,002.31	229.88	—	364.68	364.68	884.27
Sterling	822.85	1,024.15	—	201.30	104.71	306.01	762.54
Truro	457.09	460.46	148.25	—	113.69	113.69	656.90
Tyngsborough . . .	493.86	900.19	335.50 *52.00 }	406.15	776.66	1,182.81	501.72
Wellfleet	634.58	785.00	135.63	150.00	26.90	176.90	846.66
West Bridgewater . .	1,326.13	1,585.00	521.00 *66.72 }	149.65	309.73	459.38	1,312.74
West Newbury . . .	517.71	652.89	75.00	129.10	133.25	262.35	448.30
West Tisbury . . .	380.18	1,475.49	40.00	1,095.31	228.57	1,323.88	377.55

*Lead sold.

